Chronic wasting disease spreads with ease

Decades of culling and containment may be needed.
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Infectious protein might spread in urine and faeces.
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Chronic wasting disease (CWD) is more infectious than was previously thought, say US researchers. The finding suggests that tough long-term measures are needed to contain the disease, perhaps involving the deaths of thousands of North American deer.

In an experimental herd in Colorado, some 90% of animals succumbed to the disease within four years, regardless of whether their parents were infected or not. Infection is thought to spread in urine, saliva or faeces, via routes such as shared scratching posts or contaminated grazing land.

At present, up to a tenth of Colorado's 500,000 mule deer carry the disease. "Given enough time, all of the deer here will succumb," says wildlife veterinarian Mike Miller from the Wildlife Research Centre in Fort Collins, Colorado, who studied transmission rates in deer.

Since its first appearance in Colorado more than 35 years ago, the disease has spread across 12 states. In 2002, the disease appeared unexpectedly in Wisconsin, hundreds of miles to the east.

Killing deer may be the only way to curb the disease. "It's an unfortunate argument in favour of stamping out the whole herd," says infectious-diseases expert Mark Woolhouse from the University of Edinburgh, UK.

In Wisconsin, authorities aim to cull the entire deer population. Colorado officials have restricted the movement of captive herds.

Eliminating deer would harm the rural economy. In 2001, hunting generated more than $380 million across the United States, according to the US Fish and Wildlife Service.

Some also fear that, like BSE, the disease could cross over to humans. "This is unlikely," says Miller. No cases of the similar human variant Creutzfeldt-Jakob disease have been linked to eating venison. Cattle also seem resistant to CWD.

Wasting away

CWD kills elk, white-tailed deer and mule deer. Like bovine spongiform encephalopathy (BSE) in cows and scrapie in sheep, it is caused by a rogue prion, an abnormally folded protein that infects other cells. The protein builds up in the brains of infected animals, which lose coordination.

The disease can pass between unrelated animals, and from mother to unborn fawn, but it has been unclear which route is most common. To find out, Miller's team studied a herd of captive Colorado mule deer (*Odocoileus hemionus*) born to infected or healthy mothers.

All but one of the animals contracted CWD. This suggests that deer are just as likely to catch the disease from one another as they are from their mother[1].

It is not known how the disease arose in the captive animals. In the wild, where deer do not live in such close proximity, CWD spreads more slowly.

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Mike Miller
Wildlife Research Centre
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Even culling may fail to halt the epidemic. In the 1980s, a herd of captive Colorado mule deer contracted CWD and were slaughtered. Their pens were decontaminated and restocked - but nearly ten years later, the disease returned.

Miller advises a mixture of culling and containment. "We need to apply careful management across several decades," he says. "We'd rather try and fail than never try at all."

References

1. Miller, M.W. & Williams, E. S. Horizontal transmission of prion in mule deer. *Nature*, **425,** 35 - 36, (2003).
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